### **Course Information**

Instructor:	Kristin Lui	Location:	Liberal Arts 163
Email:	luik@arc.losrios.edu		ARC Main Campus
Office Hours:	By appointment	Meet Times:	Tuesday/Thursday
			6:30 pm – 9:40 pm
		Dates:	June 16, 2012 – Aug. 6, 2012
		Units	3.00

### **Course Materials**

- Textbook: *Elementary Linear Algebra* by Howard Anton, 11th Edition
- A graphing calculator is highly recommended such as a TI 83 or above.

### **Online Resources**

 Desire 2 Learn (Los Rios' official online course management system) <u>http://d2L.losrios.edu</u>

### **Proof of Prerequisite**

Students must have taken MATH 400 with a grade of "C" or better. **By June 19, 2014 (second class meeting), you must provide proof of satisfying the prerequisite or you will be dropped from the class.** Proof of satisfying the prerequisite is <u>one</u> of the following:

- LRCCD transcript
- Prerequisite/placement slip from an ARC counselor (for courses outside of Los Rios)

## Email Etiquette

When you email me, please include the following:

- Your name
- The class you are in: Math 410

Both pieces of information will help me answer your email faster.

#### Attendance

You may be dropped from the class if you have excessive absences. Los Rios Community College District and American River College define excessive absences as more than 6% of the total class hours. As this policy applies to this class, it would mean missing two classes. Please notify me of any absences in advance either by email or in-person during class (email is best).

## Catalog Description

This course provides an introduction to linear algebra including matrices, determinants, vector spaces, linear transformations, and eigenvectors. It is intended for majors in mathematics, engineering, economics, science, and related fields.

## Learning Outcomes

Upon completing this course, a student will be able to:

- Solve systems of linear equations by reducing an augmented matrix to rowechelon or reduced row-echelon form.
- Determine whether a linear system is consistent or inconsistent; for consistent systems, characterize solutions as unique or infinitely many and write parametric solutions for systems with infinitely many solutions.
- Evaluate matrix expressions using properties of matrix algebra.
- Compute the transpose, determinant, adjoint and inverse of matrices if defined for a given matrix.
- Determine if a subset of a vector space is a vector space, and if so, prove that the subset is a subspace.
- Determine if a given set of vectors is linearly independent, and if so, prove that this determination is correct.
- Determine if a given set of vectors is a basis for a vector space, and if so, prove that this determination is correct and find the basis and dimension of spaces such as those associated with matrices and linear
- Transformations or the intersection of two subspaces.
- Calculate inner products, use properties of inner products to determine angle and orthogonality, and use an orthonormal basis to find the projection of a vector on a space.
- Determine if a function that maps two vectors from a vector space to a scalar is an inner product on that vector space.
- Construct orthogonal and orthonormal bases using the Gram-Schmidt Process for a given basis.
- Construct the orthogonal diagonalization of a symmetric matrix.
- Determine the matrix for a linear transformation on Euclidean 2-space or 3-space, and for a given linear transformation, determine kernel, range, rank, nullity, and whether the linear transformation is an isomorphism.
- Compute the characteristic polynomial, eigenvalues, eigenvectors, and eigenspaces for both matrices and linear transformations.
- Use eigenvalues and eigenvectors in applications and diagonalization.
- Prove basic results in linear algebra using accepted proof-writing techniques including linear independence of vectors, properties of subspaces, linearity, injectivity, surjectivity, properties of eigenvectors, and properties of eigenvalues.

#### **Grades**

Course grades will be			Letter grades will be	
determined by the following:		assig	assigned by the scale below:	
Quizzes	15%	А	90% or above	
Homework	10%	В	80% - 89%	
Exams	50%	С	70% - 79%	
Final Exam	25%	D	60% - 69%	
		F	59% or below	
Exams	There will be four	exams. Exam	s must be taken in class	

- ExamsThere will be four exams. Exams must be taken in class. Calculators,<br/>books, and notes are <u>NOT</u> allowed during exams. There are no make-up<br/>exams without a medical excuse. You have the option of replacing your<br/>lowest exam score with your final score.
- QuizzesQuizzes will be given during class meetings. Calculators, books, and<br/>notes are <u>NOT</u> allowed during quizzes. There are no make-up quizzes.<br/><u>Two</u> of the lowest quiz scores will be dropped.
- HomeworkHomework assignments will be posted online. Two of the lowest<br/>homework scores will be dropped. Due to the compact schedule of the<br/>summer schedule, no late homework will be accepted.
- Final ExamThe final exam is cumulative. The final will be given on: <a href="https://www.icitation.com"><u>Tuesday</u></a>,August 5, 2012 at 6:30 pm 9:40 pmNo make-ups.

Important Dates						
Tentative Dates for Exams: Exam 1 June 26 Exam 2 July 8 Exam 3 July 17 Final Exam August 5	<ul> <li><u>Last day to:</u></li> <li>Drop with refunds</li> <li>Drop without a W</li> <li>Petition for P/NP</li> <li>Drop with a W</li> </ul>	June 20 June 20 June 30 July 24				

## Special Needs

If you require special needs (health or disability related issues), please contact me to discuss a plan for meeting those needs. If you are in DSP&S and wish to use their testing services, please provide me with the appropriate form.

## **Ethical Conduct**

Cheating will not be tolerated. Any student caught cheating on any exam or quiz will receive 0 points for that test and possibly a grade of F for the course. I will also report any cheating to the appropriate authorities on campus.

## **Disruptions**

Please turn your cell phone to vibrate or silent. Do not answer your cell phone or text during class. Do not talk during class. If you are too disruptive in class (excessive talking, repeatedly leaving the class to answer your phone, etc.), I may ask you to leave.

## Disclaimer

The instructor reserves the right to alter this syllabus to conform to Los Rios Community College District Policies, state law, or to improve the quality of education offered by the class. Any changes will be announced in class.

Week	Tuesday	Thursday	
1	June 17	June 19	
	Introduction 1.1, 1.2, 1.3	1.4, 1.5, 1.6	
	June 24	June 26	
2	1.7, 2.1, 2.2	Exam 1 2.3, 3.1	
	July 1	July 3	
3	3.2, 3.3, 3.4	3.5, 4.1, 4.2	
	July 8	July 10	
4	Exam 2 4.3, 4.4	4.5, 4.7, 4.8	
5	July 15	July 17	
	5.1, 5.2, 6.1	Exam 3 6.2, 6.3	
	July 22	July 24	
6	7.1, 7.2, 1.8	4.9, 4.10, 8.1	
	July 29	July 31	
7	8.2, 8.3	Exam 4 Review	
8	August 5		
	Final		